

REMARKS

Claims 1, 5, and 14-16 remain pending in this application upon entry of this amendment. Favorable reconsideration is requested in view of the amendments and following remarks.

I. Rejection Under 35 U.S.C. § 112, second paragraph

The Examiner rejects the claims pursuant to 35 U.S.C. § 112, second paragraph, on the ground that the previous amendments allegedly render the claims indefinite in the recitation of a “single” abrupt impact. In accordance with the Examiner’s comments, the term “single” has been removed. The rejection, therefore, should be withdrawn.

II. Rejections Under 35 U.S.C. § 103(a)

The claimed invention is a scribe line forming apparatus and related method. Aspects of the invention, as recited in claim 1 for example, include a vertical crack forming member, an impact force applying means, and heating and cooling means. The vertical crack forming member has a blade that forms a vertical crack to be an origination point of a scribe line by pressing the blade against the surface of a brittle substrate. The impact force applying means applies an abrupt impact force to the vertical crack forming member to generate the vertical crack. The scribe line is formed originating from this initial crack as a result of stresses generated by a temperature gradient created by the heating and cooling means. Comparable features are recited in independent claim 14.

Regarding the impact force applying means, under the plain meaning of the claim terms, an “impact” is the striking of one body against another. “Abrupt” means sudden or quick. (See, e.g., *Random House College Dictionary*, Revised Edition (1984).) As demonstrated below, the references cited by the Examiner do not disclose or suggest at least an “impact force applying means applies an abrupt impact force to the vertical crack forming member to generate the vertical crack.”

A. Rejections Based on Ishikawa

Claims 1, 5, and 14-16 again stand rejected pursuant to 35 U.S.C. § 103(a) as being obvious over Hoekstra et al. U.S. Patent No. 6,489,588 (Hoekstra) in view of Ishikawa et al., U.S. Patent No. 6,536,121 (Ishikawa). As in the previous Office Action, the Examiner recognizes that Hoekstra does not disclose the impact force applying means. The Examiner, however, concludes that Ishikawa discloses an impact force applying means, and that it would have been obvious to combine the impact force applying means of Ishikawa with the scribing apparatus of Hoekstra to arrive at the claimed invention.

Ishikawa discloses a purported improvement to a scribing apparatus that uses a vibrating cutting blade. The Examiner continues to consider a vibrating cutter as disclosing an abrupt impact, viewing each vibration as an "abrupt impact." (Final Office Action at page 5.) The Examiner, however, mischaracterizes the nature of a vibrating scribing device. Once scribing begins, ***the cutter should never leave contact with the substrate.*** As Ishikawa itself states:

The scribing apparatus has a vibration generation member generating a vibration in a scribe body, and the scribing apparatus vibrates the cutter disposed on a lower end of the scribe body. When the cutter stays in contact with the work surface, the scribe body vibrates ***without changing a position of the cutter.*** Therefore, a pressure applied to the work by the cutter vibrates periodically, and a deep vertical cracks [sic] is generated on the work surface in a work thickness direction.

(Col. 1, lines 10-18, emphasis added.) Indeed, the purpose of the purported improvement of Ishikawa is to prevent the cutter from losing contact with the substrate as a result of the vibrations. Thus, in a vibration scribe, the vibrations alter the ***force*** of the cutter, not its ***position***. Contrary to the Examiner's conclusion, therefore, each vibration cycle does not generate an "abrupt impact".

As indicated in the current application, the "abrupt impact" is an impact at the origination of the scribe line to prevent unwanted cracking, particularly at the edge of the substrate. (See, e.g., Application at page 15, lines 3-19.) Following this initial impact, a laser scribing process proceeds. The claimed invention is thus properly

understood as a process that includes an initial abrupt impact to initiate scribing, followed by a scribing process that differs from the initial impact.

The process of Ishikawa is merely a variation on scribing using mechanical vibrations, a known alternative to laser scribing. The nature of the vibrations is essentially uniform over the entire process. Ishikawa does not disclose any feature for providing an initial impact that differs from the remainder of the scribing process. Ishikawa, therefore, does not disclose providing an abrupt impact, followed by a scribing process that differs from the abrupt impact, as claimed. Accordingly, Ishikawa does not disclose the claimed impact force applying means.

In addition, one skilled in the art would not combine the disclosures of Hoekstra and Ishikawa. In response to the previous Office Action, Applicants argued the devices of Hoekstra and Ishikawa operate based upon different scribing technologies (laser scribing versus mechanical vibrations), and therefore the references should not be combined. To do so would result in a change of the principle of operation of the primary reference, Hoekstra, which would render the teachings of the references insufficient to deem the claims *prima facie* obvious. See MPEP § 2143.01 (VI).

The Examiner's response to this argument is unclear, but apparently is based on a purported distinction between generating a "micro-crack" (as characterized in Hoekstra) versus a deeper "crack". (See Final Office Action at pages 8-9.) As to the claimed impact force applying means, however, the significance of the feature is not any purported adjustment to the depth of the crack. Rather, the issue is how the crack (whatever the specific depth) is initiated, particularly at the edge of the substrate. Because Ishikawa does not address specific issues associated with crack initiation, Ishikawa cannot be the basis for modifying Hoekstra to provide an abrupt impact to initiate the crack.

For the foregoing reasons, a combination of Ishikawa and Hoekstra lacks, and does not disclose or suggest, at least the claimed impact force apply means. Accordingly, claims 1, 5, and 14-16, are not obvious over Hoekstra in view of Ishikawa, and the rejections should be withdrawn.

B. Rejections Based On Insolio

Claims 1, 5, and 14-16 also stand rejected pursuant to 35 U.S.C. § 103(a) as being obvious over Hoekstra in view of Insolio, U.S. Patent No. 3,276,302 (Insolio), a newly cited reference. Similar to the above, the Examiner recognizes that Hoekstra does not disclose the impact force applying means. The Examiner, however, concludes that Insolio discloses an impact force applying means, and that it would have been obvious to combine the impact force applying means of Insolio with the scribing apparatus of Hoekstra to arrive at the claimed invention.

The Examiner characterizes the device of Insolio as a solenoid actuated cutting device, wherein the solenoid controls the pressure or force applied by the cutter. Springs 162 bias the carriage 130 (with the cutter) away from the engaged position. In operation, the solenoid and springs control the positioning of the cutter to place it gently adjacent the substrate, at which time a full cutting voltage may be instantly applied. (See, e.g., col. 3, lines 1-7; Figs. 7-9.)

The Examiner has interpreted the instant application of the full cutting voltage as an “abrupt impact”. Applicants submit that the Examiner has mischaracterized Insolio. This portion of Insolio is concerned with an issue that the cutter and/or glass may be damaged either when the cutter first impacts the glass, or if the cutter contacts the glass prematurely while the solenoid is still extending the cutter to the full cutting depth. (See col. 14, lines 30-40.) To address these issues, carriage wheels 136 aid in positioning the cutter out in front of the edge of the glass. (See, e.g., Fig. 8.) A low voltage is applied to the solenoid to slowly extend the cutter into position, which reduces the likelihood of impact damage. Once in position, the full voltage is immediately applied. (Col. 16, lines 35-46.)

In other words, Insolio ***teaches away*** from providing an abrupt impact to initiate the cutting process. The spring, solenoid, and carriage slowly position the cutter into the cutting position in front of and adjacent the substrate. The low voltage is then raised to the full voltage. By first applying the low voltage, an abrupt impact (and the potential for impact damage) is avoided. In addition, the “full voltage” is the cutting voltage that is maintained throughout the cutting process. There is, therefore, no

sudden and quick "abrupt impact" followed by a differing cutting process, as in the claimed invention.

For the foregoing reasons, a combination of Insolio and Hoekstra lacks, and does not disclose or suggest, at least the claimed impact force apply means. Accordingly, claims 1, 5, and 14-16, are not obvious over Hoekstra in view of Insolio, and the rejections should be withdrawn.

III. Conclusion

Accordingly, claims 1, 5, and 14-16 are believed to be allowable, and the application is believed to be in condition for allowance. A prompt action to such end is respectfully requested.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Respectfully submitted,

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